Montana Comprehensive Assessment System (MontCAS, Phase 2)

Criterion-Referenced Test (CRT)

Common Constructed-Response Item Release
Mathematics, Grade 8

2007

OPI

OFFICE OF PUBLIC INSTRUCTION

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Mathematics

Session 1 (Calculator)

You may use a calculator during this session.

25. The frequency table below shows the number of ounces of water each member of a health class reportedly consumes on a normal day.

Daily Water Consumption

Number of Ounces of Water	Frequency
8	2
16	4
24	3
32	3
40	2
48	1
56	1

a. How many members are in the health class? Show or explain how you found your answer.

b. What is the median number of ounces of water consumed by members of the health class? Show or explain how you found your answer.

c. What is the mean number of ounces of water consumed by members of the health class? Show or explain how you found your answer.

Scoring Guide

Score	Description
4	5 points
3	$3\frac{1}{2} - 4\frac{1}{2}$ points OR 3 points provided at least one point from each of parts b and c.
2	$1\frac{1}{2} - 3$ points
1	$\frac{1}{2}$ or 1 point
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response.

Scoring Notes

Part a: 1 point — for correct answer, **16 (members)**, with correct work or explanation

OR

$\frac{1}{2}$ point — for correct answer with incomplete or no work or explanation

or

for correct strategy that may have one computational error

Part b: 2 points — for correct answer, **24 (ounces) or correct based on incorrect part a**, with correct work or explanation

OR

1 point — for correct answer with incomplete or no work or explanation

or

for correct strategy that may have one minor error

OR

$\frac{1}{2}$ point — finds the median without considering the frequency, 32 (ounces)

Part c: 2 points — correct answer, **27 (ounces) or correct based on incorrect part a**, with correct work or explanation

OR

1 point — for correct answer with incomplete or no work or explanation

or

for correct strategy that may have one computational error

OR

$\frac{1}{2}$ point — finds the mean without considering the frequency, 32 (ounces)

Sample Response:

Part a: $2 + 4 + 3 + 3 + 2 + 1 + 1 = 16$

Part b: The median is the middle number in the list when the list is in numerical order. There are 16 numbers, so the median is the average of the 8th and the 9th numbers in the list. Both the 8th and the 9th numbers are 24, so the median is also 24.

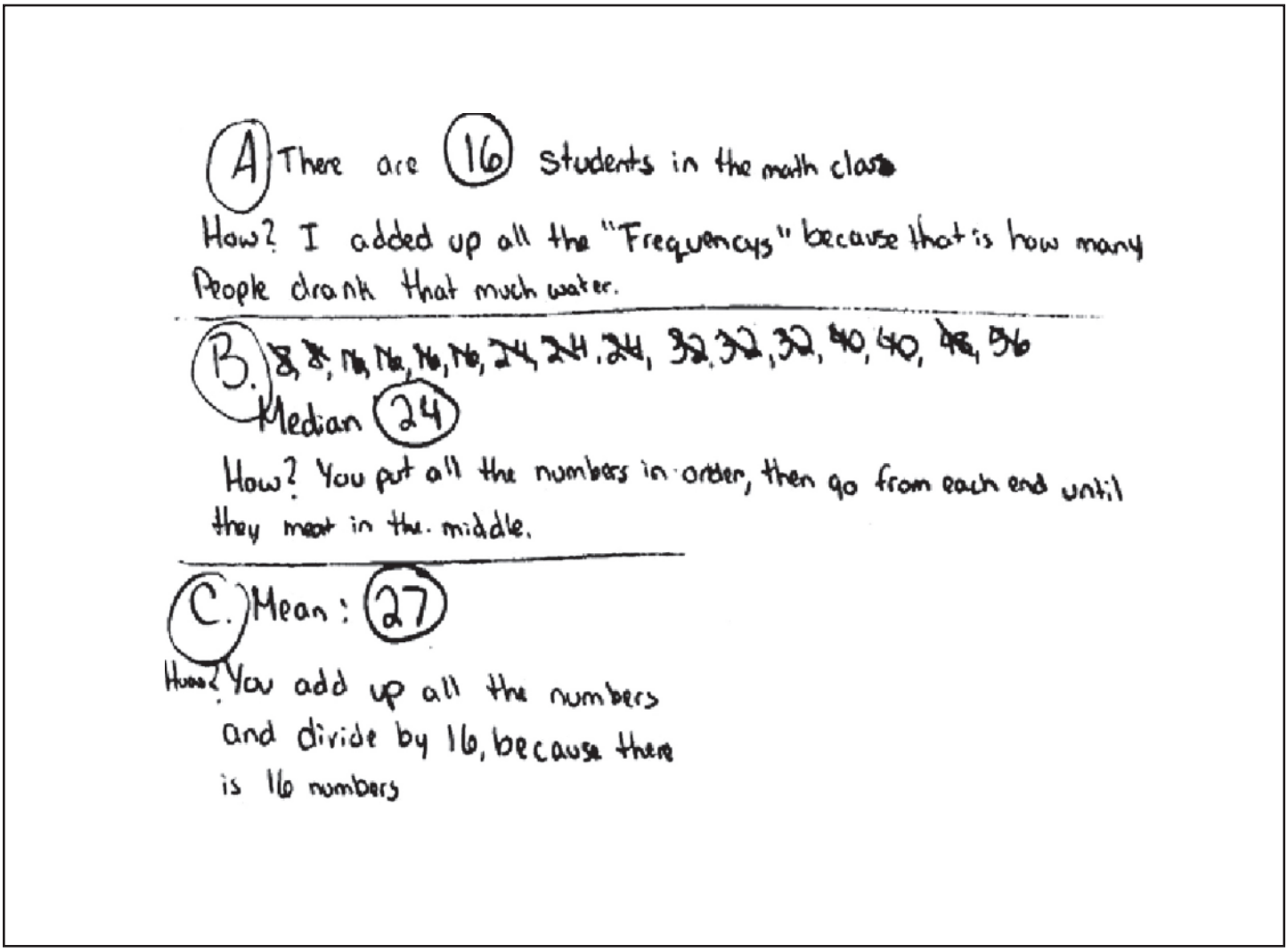
Part c: $((2 \times 8) + (4 \times 16) + (3 \times 24) + (3 \times 32) + (2 \times 40) + (1 \times 48) + (1 \times 56)) \div 16 = 27$ oz.

OR

27 ounces; to find the mean, you have to add all of the numbers together and divide by the number of members.

Score Point 4

Sample 1



Score Point 4

Sample 2

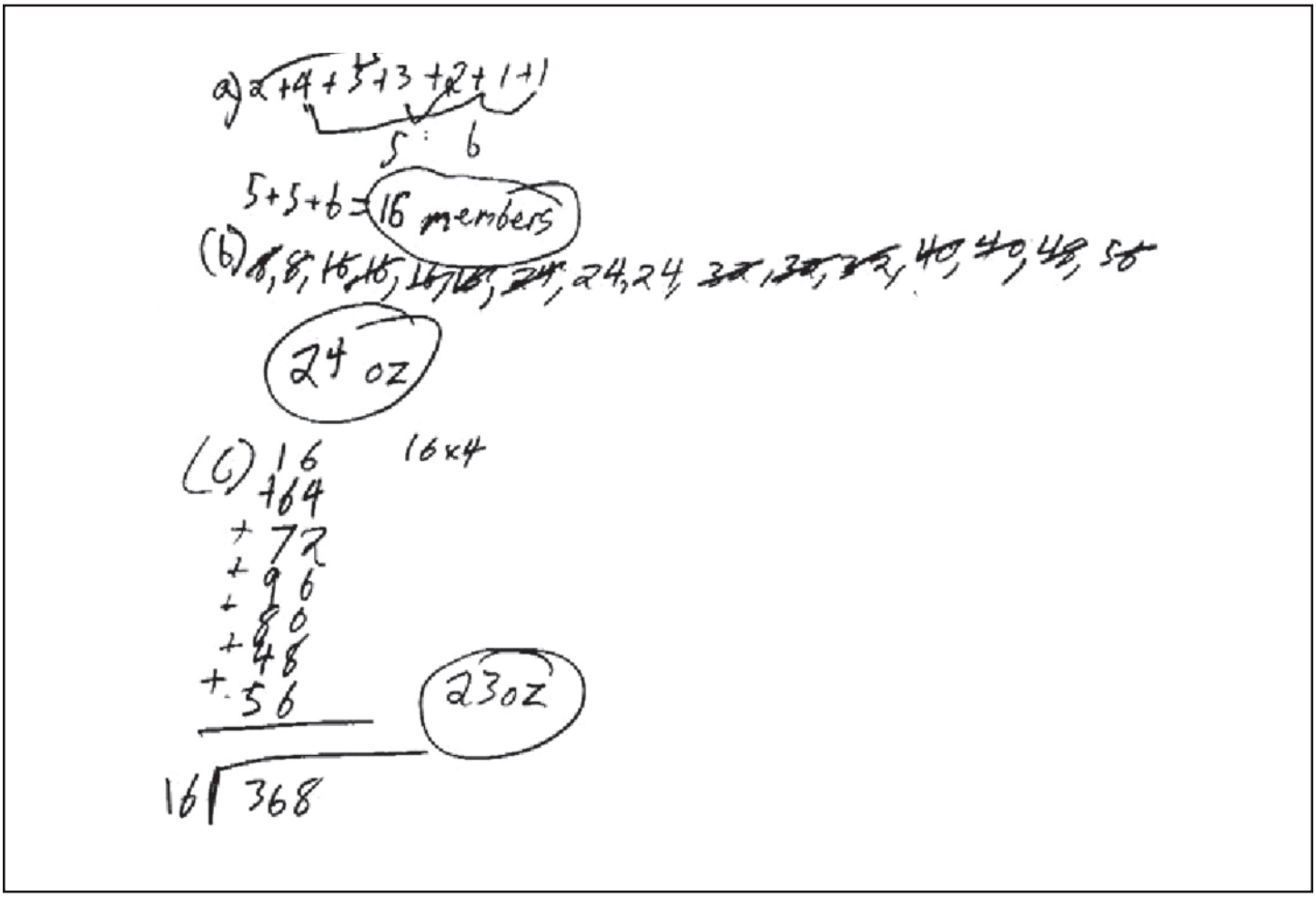
A) There are 16 students in the health class.
2+4+3+3+2+1+1=16

B) The median number of ounces of water consumed is 24 ounces.
8, 8, 16, 16, 16, 16, 24, 24, 24, 32, 32, 32, 40, 40, 48, 56

C) The mean number of ounces of water consumed is 27 ounces.
8+8+16+16+16+16+24+24+24+32+32+32+40+40+48
36=432÷16=27

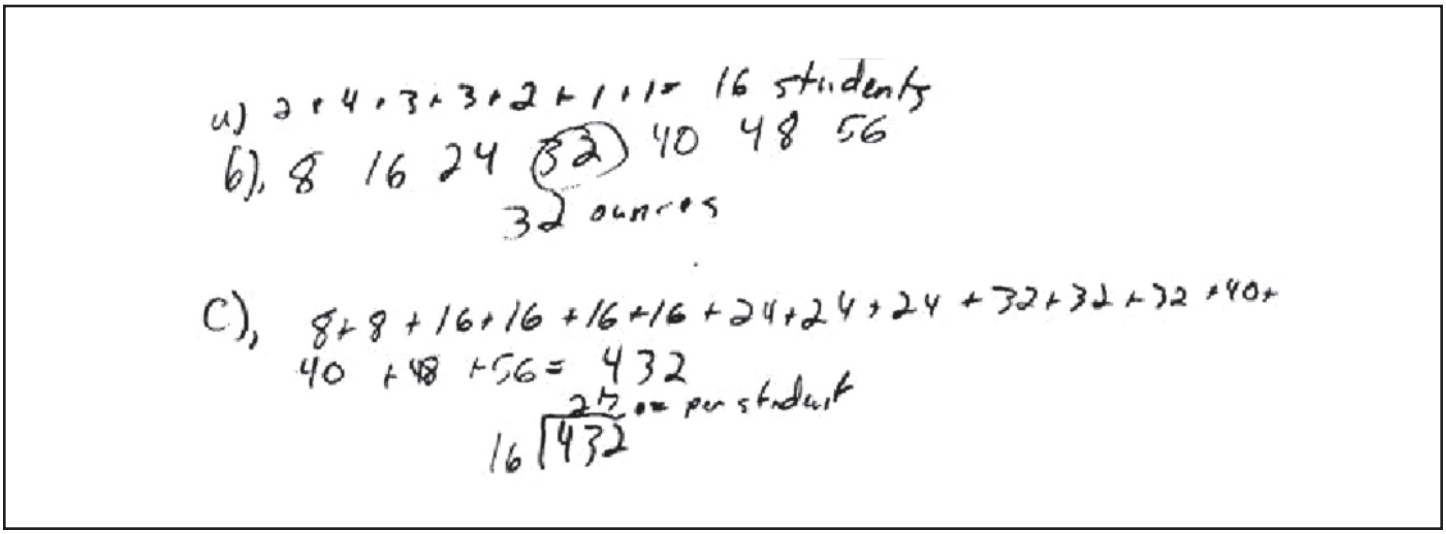
Score Point 3

Sample 1



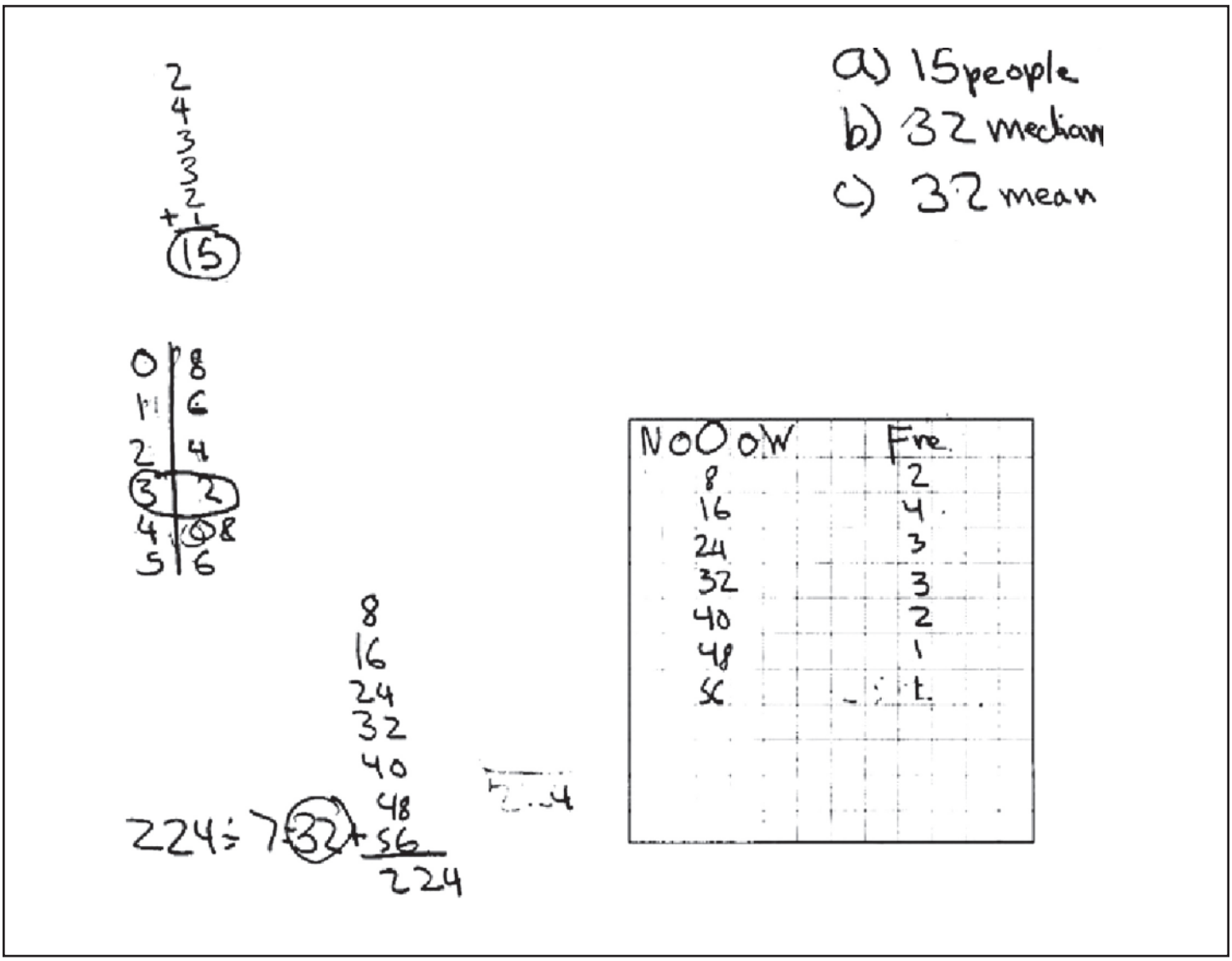
Score Point 3

Sample 2



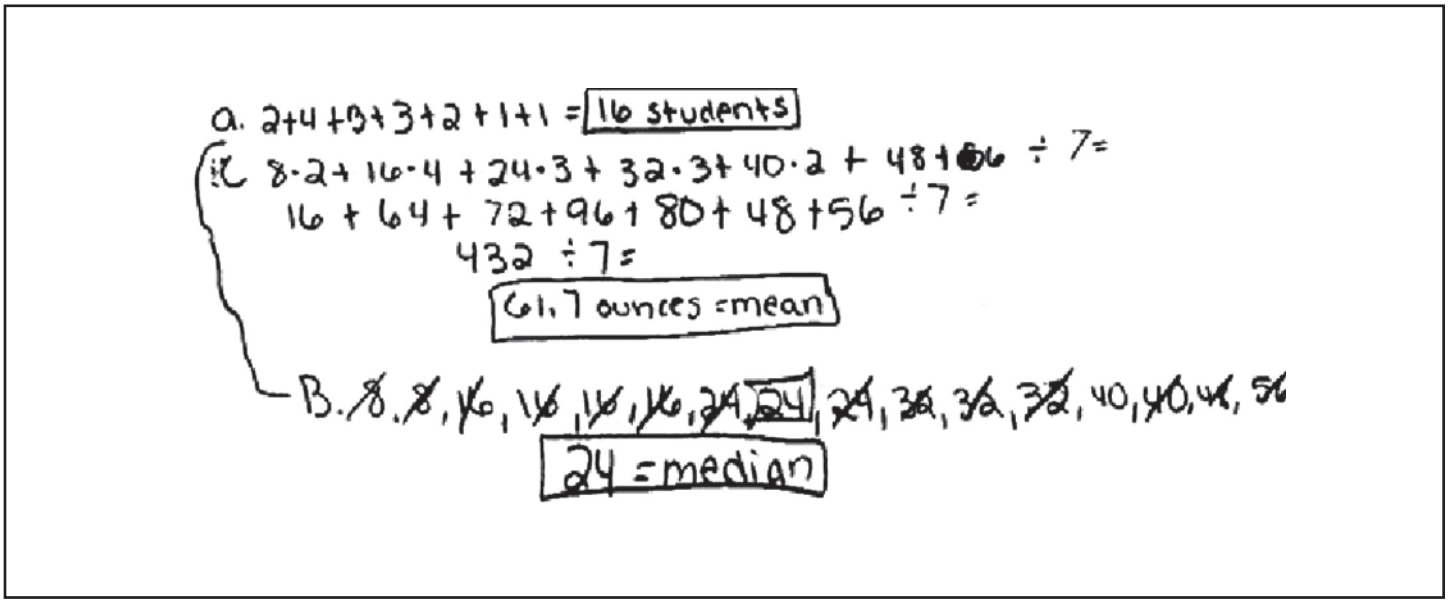
Score Point 2

Sample 1



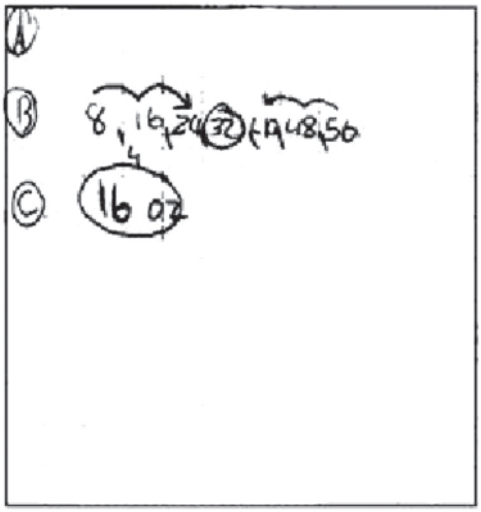
Score Point 2

Sample 2



Score Point 1

Sample 1



Score Point 1

Sample 2

a. 16 people. I found my answer by counting all the numbers in the Frequency list.

b. 4 ounces. I found my answer by looking at the table and seeing which number is bigger in the frequency list.

c. The mean number is 56 and the frequency is 1. I found my answer by looking at the table.

Score Point 0

Sample 1

a) 7people cause each line is for one person and how much they consume

b) 16, 40, 56, 64, 72, 80, 96

64 oz

c)

# of oz	x	Frequency
8	x	2
16	x	4
24	x	3
32	x	3
40	x	2
48	x	1
56	x	1

16 + 64 + 72 + 96 + 80 + 40 + 56

60.6 oz

Score Point 0

Sample 2